

Name:

Solutions

Directions: For each rational function:

1. Identify an equation for each vertical asymptote (asymptotic discontinuity), if any exist.
2. Identify an equation for each horizontal asymptote, if any exist.
3. Identify the coordinates of any y-intercept or x-intercepts, if any exist.
4. Identify any value of x for which the graph has a hole (removable discontinuity)
5. Draw a neat and accurate graph of the function if there is a coordinate plan to the right.

1. $f(x) = \frac{x-3}{x+1}$

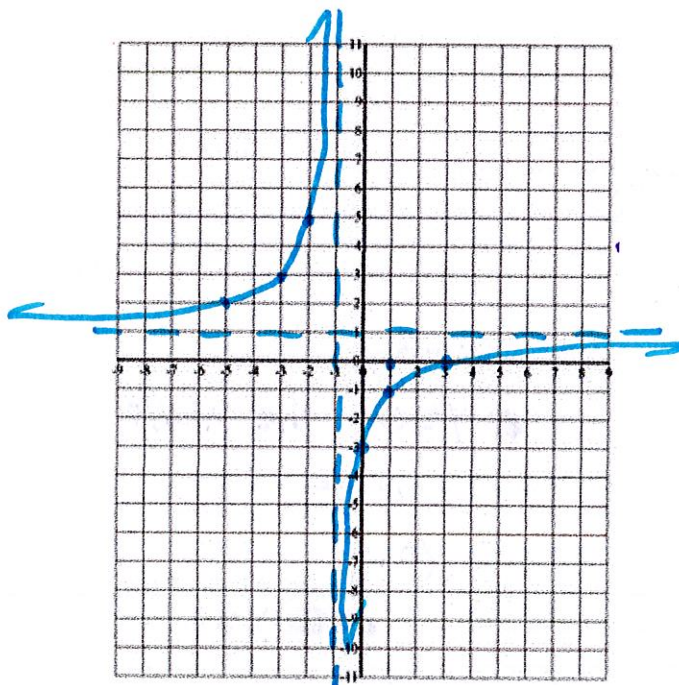
VA: $x = -1$

HA: $y = 1$

X-Intercept(s): $(3, 0)$

Y-Intercept: $(0, -3)$

X-Value of Hole: *None*



2. $f(x) = \frac{8}{x-4}$

VA: $x = 4$

HA: $y = 0$

X-Intercept(s): *None*

Y-Intercept: $(0, -2)$

X-Value of Hole: *None*

3. $f(x) = \frac{x^2 + x - 6}{x + 3}$ or $f(x) = \frac{(x+3)(x-2)}{x+3}$

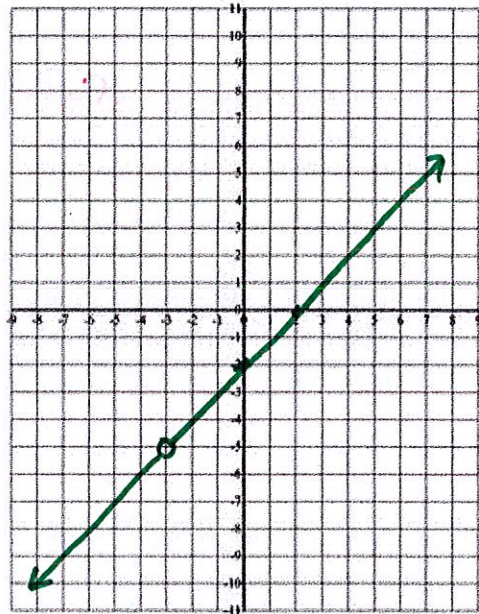
VA: *None*

HA: *None*

X-Intercept(s): $x = 2$ (2, 0)

Y-Intercept: (0, -2)

X-Value of Hole: $x = -3$



4. $f(x) = \frac{x-1}{x^2 + 2x - 3}$ or $f(x) = \frac{x-1}{(x-1)(x+3)}$

VA: $x = -3$

HA: $y = 0$ the x-axis

X-Intercept(s): *None*

Y-Intercept: (0, $\frac{1}{3}$)

X-Value of Hole: $x = 1$

5. $f(x) = \frac{x-6}{x^2 - 2x - 3}$ or $f(x) = \frac{x-6}{(x+1)(x-3)}$

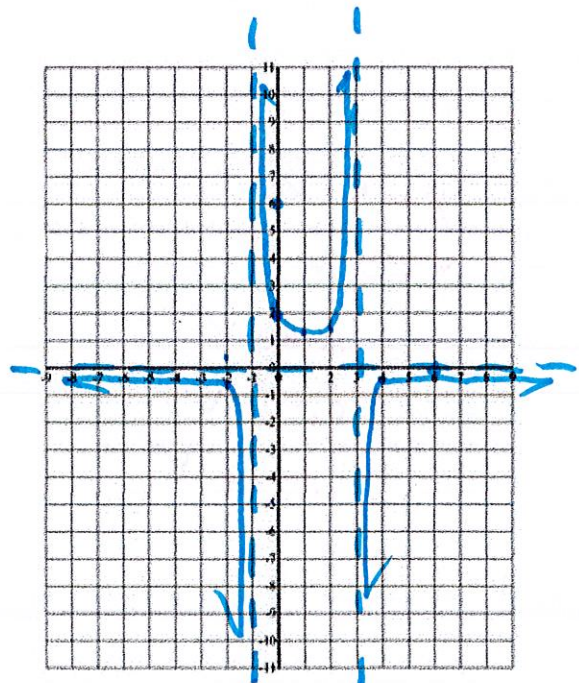
VA: $x = -1$ & $x = 3$

HA: $y = 0$ the x-axis

X-Intercept(s): (6, 0)

Y-Intercept: (0, 2)

X-Value of Hole: *None*



6. $f(x) = \frac{3x^2 + 5x + 2}{3x^2 - 10x - 8}$ or $f(x) = \frac{(x+1)(3x+2)}{(3x+2)(x-4)}$

VA: $x = 4$

HA: $y = 1$

X-Intercept(s): $(-1, 0)$

Y-Intercept: $(0, -\frac{1}{4})$

X-Value of Hole: $x = -\frac{2}{3}$

7. The best choice for an equation of the graph of the rational function BELOW is:

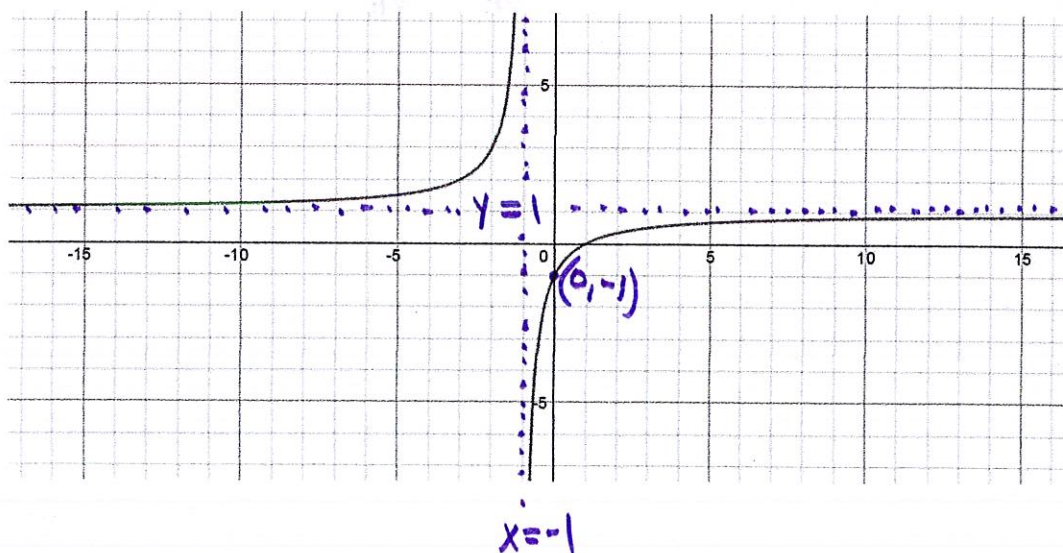
a. $f(x) = \frac{x-1}{x^2-1}$

b. $f(x) = \frac{x+1}{x-1}$

☒ c. $f(x) = \frac{x-1}{x+1}$

d. $f(x) = \frac{x+1}{x^2-1}$

e. None of the above



8. The graph below does not cross the x-axis. The best choice for an equation of the graph of the rational function BELOW is:

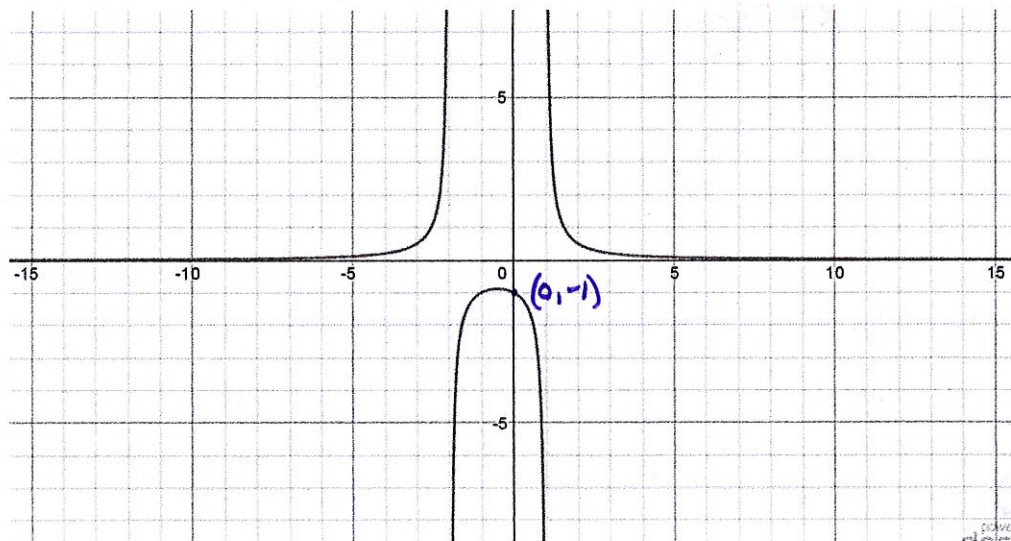
a. $f(x) = \frac{-2}{(x+2)(x-1)}$

c. $f(x) = \frac{-2}{(x-2)(x+1)}$

e. None of the above

b. $f(x) = \frac{2}{(x+2)(x-1)}$

d. $f(x) = \frac{2}{(x-2)(x+1)}$



$y=0$
HA

$x=-2$ $x=1$
VA VA